

A
LECTURE

ON

“Some Ways and Means
of Health ;”

Delivered to the Members and Friends of
St. George's Young Mens' Society,
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BY


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"SOME WAYS & MEANS OF HEALTH."

As a vice-president of St. George's Young Men's Society, it affords me great pleasure to address to you this evening a few salient points on "some ways and means of health." I donbt not that some of you are acquainted with Addison's beautiful allegory "The Vision of Mirza," who, led by his guide, looks eastward to a great valley, through which flows a rapid tide. The valley, his guide informs him, is the vale of misery, and the tide of water forms part of the great tide of eternity called Time. Across this shoreless ocean passes a lengthy bridge. At either end the bridge is cloaked in somhre shadow, and the bridge, Mirza is informed, is meant to typify hman life. The bridge contains three score and ten arches, bnt at its far end are several arches incomplete and broken. Multitndes throng the bridge, and Mirza is horrified to find that, as they pass on their way across its arches, the passengers now and then disappear mysteriously from sight, and fall through trap doors which lie in their path. The mōst frequent pitfalls are at the beginning of the bridge and at its end ; there are fewer pitfalls in the middle. The parable is one, as you know, of human life. The pitfalls, which are most nnmerous in the beginning of the bridge of life, represent the diseases and chances of death to which infancy is most snbject, and it is natural that towards the close of existence the pitfalls should also again become multiplied. Many important lessons may be derived from this allegory, and especially lessons that are intimately connected with *our* snbject. Let us take the one that comes very prominently before us, and is taught by a physiological review of the allegory of Mirza, that while the pitfalls in life's pathway are very nnmerous, yet science is competent to lessen the number, and I shall try to show you that these pitfalls may be lessened by attention to one aspect of life, namely, personal health. In assigning to one short lecture a subject capable of nnmerons and wide ramifications, only some leading ideas can be presented, some principles laid down as general guides, and some snggestions made, in the hope that

some of them may be useful to you as *ways and means* to the preservation of your own health. Should I repeat what you have already heard, I must hope to be excused, seeing that is consequent in so well worn a subject, for as an engineer who wished to explain fully the use and action of a piston would have to speak of many other parts of a steam engine, so a glance may be taken at many points if we would appreciate the importance of health and the relation in which it stands to other things. You may ask me for a definition of health. There are public acts and laws which, observed, promote the health of communities, so there are rules of living and habits of life inculcated by competent observers by attention to which the health of the individual may be preserved or increased. Health, then, is a quality of body easily comprehensible, but difficult to define. It is dealt out in different measures at different periods of life, and is perhaps best described as exemption from disease. That state of the body which enables it to perform every function which can reasonably be required of it, to accomplish each ordinary task, and to be equal to some exertion of brain and muscle without painful sense of fatigue, is what we ordinarily understand as health. Man to enjoy health must take food and drink. Food is required for three chief purposes. (1) To replace the losses continually taking place from the body. (2) To maintain the animal heat, or, in other words, to supply warmth; our clothes are only for the purpose of keeping that heat in, and it is from our food that the heat itself is derived. (3) To supply force for performing work. The sources of our food are chiefly in the animal and vegetable life. We differ from plants in that they take the ultimate elements and build them up into food for themselves, but we require to have them built up into structures of a certain complexity before they are fitted for our nourishment. We are like the bricklayer, who cannot build a wall from the clay of a brickfield, but must have it first shaped and burnt into bricks for him. It is within the range of possibilities that in the future we may have the power of building up elements. I expect our chemists will yet accomplish this, so that by synthesis (*i.e.*, putting two or three things together) of the ultimate elements they will give us food prepared without the intervention of plants and animals. I may take an article of food and resolve it into its original elements, but it is a difficult thing to build it up again. For instance, I may take white sugar,

which is composed of carbon or coke and water. It is easy enough to remove the water from the carbon by means of a chemical liquid—strong sulphuric acid—which has such an affinity for water that when it is poured on the sugar it withdraws all the water, and the sugar is converted into a black spongy mass of charcoal. What we desire is that our chemists shall discover for us how to put coke and water together to make sugar, so that instead of going to the cane fields of the West Indies, or to the beet fields of France, we may apply for sugar as well as coals at our collieries. As I say, we may be within a reasonable distance of this, for the last quarter of a century has produced to us the beautiful aniline dyes, the artificial oils of almonds, and artificial essence of pine apples so much used in perfumery and confectionery, from the waste products of coal. In order to sustain life our food must consist of a proper apportionment of the following elements:—(1) Nitrogenous matters to build up the flesh and nourish the muscular parts of the body—for example, fibrin, albumen, and casein, or curd. (2) Hydrocarbons to keep up the animal heat and to provide fat for the body—for example, fat, sugar, and starch. (3) Mineral matters, or salts, to supply the bones, hair, and nails, besides having an important chemical action upon the solids and fluids of the body—for example, lime, potash, soda, magnesia, and the phosphates. Whilst these principles hold different relative positions of value, the absence or deficiency of either group will render a diet unfit for the support of life. Milk, the product provided by nature as the sole article of sustenance during the early life of mammals, may be regarded as furnishing us with a typical dietetic representative of all these principles. The egg also holds a like position, and, as all the parts of the young animal are evolved from it, must need comprise all the materials for the development and growth of the body. The required principles are contained in food derived from both the animal and vegetable kingdoms, and the diet of man may be drawn from either, but, looking to man's general inclination and the conformation of his digestive apparatus, it may be assumed that a mixed diet is that which is designated in the place of nature for his sustenance, and it is that upon which he attains the highest state of physical development and intellectual vigour. As I told you, our systems require a certain quantity of carbon and nitrogen to keep up the equilibrium of health; a healthy man requires 300 grains of nitrogen and 4,600 grains of carbon daily to supply the

waste that takes place during the twenty-four hours. Such being the case, we must select a diet which can supply as nearly as possible the necessary amount of these substances. It matters little whether it is vegetable or animal, so that we get what is required. Vegetarians, as some people call themselves, live for the most part on vegetables, and there is no doubt that a well selected vegetable diet is capable of producing in the greater number of individuals a high physical development. It would, I think, be difficult for the majority of working men to get such a diet of vegetables, as would be necessary all the year round: so, as a general rule, most of us have a mixed diet, that is, partly vegetable and partly animal. A good proportion is to have one of animal to four of vegetable. Let us now endeavour to estimate the value of butchers' meat as an article of diet. 1,000 grains of it contains 100 grains of carbon and 300 grains of nitrogen; therefore, to obtain the 4,600 grains of carbon which the system requires, no less than 6½ lbs. of meat must be consumed daily, whilst the requisite 300 grains of nitrogen are contained in 1½ lbs. of meat, consequently three or four times more meat must be consumed to supply the carbon than is necessary to furnish the nitrogen. You will at once understand that a diet solely composed of butchers' meat is a very bad one. As a contrast let us examine the value of bread as a food. 1000 grains contains 300 grains of carbon and 10 of nitrogen: hence to obtain the 300 grains of nitrogen required by the system, 30,000 grains, or more than 4 lbs., must be consumed; but the 4,600 grains of carbon required are contained in 15,000 grains of bread (say 2 lbs), so that to obtain the requisite supply of nitrogen, a quantity of bread must be consumed containing exactly double the quantity of carbon required. From these facts you may see the value and economy of a mixed diet, since by calculation we find that 2 lbs. of bread and three-quarters of a pound of meat are sufficient to compensate the daily loss of the system of a healthy man. Average beef or mutton is calculated to contain 15 per cent. of carbonaceous and 20 per cent. of nitrogenous material. Potatoes have 24 per cent. carbonaceous and 2 per cent. nitrogen, or 12 of carbon to one of nitrogen, or very nearly the proportion of 15 to 1 which we found the system required. Oatmeal has 66 per cent. carbonaceous and 16 nitrogenous material; thus it has nearly as much nitrogenous matter as beef, and four times as much carbonaceous, and so is a much better

article of food than beef, taken alone, as regards the requirement of the system. I need hardly tell you that in some parts of Scotland, the Scottish ploughman works his day's work on porridge and milk for breakfast, milk and porridge for dinner, and porridge and milk for supper. You will all probably remember the story of the Scotchman, Lord Eilbank, who was twitted with Dr. Johnson's definition of oats, that it is a grain given in Scotland to man and in England to horses. "True," said he, "and where will you find finer men or finer horses?" Porridge and milk is a typical food, as it contains all the necessary constituents of food in the most perfect proportions. In reading, concerning the food of the ancients, I find the great lawgiver of Crete had great faith in common meals, introducing into the State a kind of equality—the eating of the same food by all classes. Minos furnished his table for all alike, at the expense of the Republic; and he appeared to have had three chief objects in view, namely, (1) to teach the people that it was each man for his neighbour, and not each for himself; (2) to train them in habits of temperance and frugality; and (3) to prepare the young men for the customs of war, when the soldiers would be obliged to eat in common. The early Greeks were probably vegetarians, and were strictly temperate—they were satisfied with the simplest fruits, and drank water. The early Romans had much the same conditions, their ordinary repasts consisting of milk, herbs, and roots; on festive occasions they partook of animal food. But there came a time when they went to the opposite extreme. The "Yorkshire pie" of the past was notable for the variety of its contents, but was simplicity itself compared with the "Trojan horse" of a fashionable Roman banquet. This dish was a whole boar, disembowelled, and filled with small animals and birds. I need not enlarge upon the points—not to eat too much food, nor eat too often. We eat to live, and do not live to eat. The ancient Romans, at their feasts, ate for pleasure; and when the stomach was full, so that they could eat no more, they would retire for a short time, and then return to eat with renewed vigour. During that absence, by the assistance of a feather, the stomach had been emptied to allow them the pleasure of eating to repletion once more. My last lesson to you with regard to food is not to eat too often. That all work, and no play, makes Jack a dull boy, is equally true with regard to the stomach. It must also have rest. Too frequent eating and long fasts are both to be depre-

cated. Three meals for one day are quite sufficient, if taken at regular intervals. It is impossible to be dogmatic in questions of diet. Each man must ascertain for himself the dietary which best supplies his physiological requirements. The fact that most vegetarians condemn the use of milk, butter, and eggs, reveals the scientific weakness of their cause, and shows only too plainly its one-sidedness. Butter, of all fatty matters, is the most easily assimilated and the most readily digested; whilst milk helps to make the most typical diet we possess. When a person thinks that his mode of diet is not satisfactory as regards his health, he should try the effect of the gradual withdrawal of these articles which he suspects are injurious to him, either from their nature or the amount in which they are taken, and so arrive at a personal equation of his digestive capabilities. But that the same diet will be suitable for everybody alike is contrary to the teaching of physiology and of experience. We now come to drink. I am not here to give you a lecture on temperance principles, and so will say little on this point. Given digestible, solid food, and fair digestive power, water alone is all sufficient as liquid. During the feebleness consequent on disease or overwork, everything is changed; there is blood, though impoverished in quality, to receive and convey nutritive material, and there are tissues to be fed, but the *vis a tergo*, the driving power of the heart, resides in a feeble muscle. Nature is flagging, and a stimulant alone will make ends meet in the circle of tissue building processes, but, as a general rule, the more simply a man fares the more he will gain in health, in life, in working power, and in aptitude to benefit by stimulation when strength is failing from disease or from decay. Stimulants are not foods, in health are not required, in disease they will be ordered where useful by your doctor. But people must have some drink, and if beer or spirits are not the thing, you may ask me what is. I believe there is nothing better to work upon than a thin gruel made of well boiled oatmeal, and a little sugar in it. I state this to you on the authority of the late Dr. Parkes, a most eminent military surgeon, who studied these matters fully. A little time ago, I was paying a visit to a patient just as the husband, a collier, was going to his work, taking with him a large bottle of liquid with a white sediment at the bottom. I asked him what it contained. He replied, "Oatmeal and water; it is better for my work than tea." Of the national drinks, cocoa, coffee, and tea, although such dis-

similar substances in apperance, their active principles—cocoine, csffeine, theine—are identical. When these drinks are taken, their active principle is absorbed and acts as a stimulant to the nervous system, and under ordinary circumstances are preferable in this respect to alcoholic drinks. The Turks drink a surprising quantity of coffee, and thrive. Perhaps some may deny that they do thrive, and would attribute their degeneracy as a people to coffee and tobacco combined. This, however, would prove, to the refutation of the teetotallers, that a nation can come to grief through weaker stimulants than alcohol. I remember reading somewhere the story of a gentleman who drank green tea till he fancied himself pursued by a black monkey, but I never met with a living instance of a man being thus affected with the symptoms of *delirium tremens* through intemperance with his tea-pot. If tea be drunk till it causes excitement, there must, no doubt, be re-action in some form, and that form may be irritability. But I think Dr. Edwards, Dean of Bangor, in his late address, brews his words a little too strong when he says that excessive tea drinking "creates a generation of nervous discontented people, who are ever complaining of the existing order of the universe, scolding their neighbours, and sighing after the impossible." It happens that the Chinese, who are the greatest tea drinkers on earth, are also the most conservative and routine-ridden of mankind. The Celestials would long ago have been given over to Nihilism if "the cup that cheers and does not inebriate" inspired discontent with the existing order of the universe. I would not for a moment be held to countenance the abuse of what in moderation is undoubtedly a tranquilliser of the temper and a pleasant and harmless stimulant. There is a medium in all things, even in those where the worst is not very bad nor the best very good. Hard-worked minds and fatigued bodies are often the better for some gentle stimulant that rouses into gentle activity the nerves that minister to animal life and comfort. Tea has its uses and abuses, like most other things — taking strong tea to excess is certainly pernicious. Oatmeal and milk are excellent things, but are scarcely fitted for the drawing-rooms of society, and society must have its pleasures as well as carry out its duties. Tea is more of a pure beverage than coffee, and hence it is possible to use it as a mere luxury, for it requires scarcely any digestive effort and does not "cloy" the palate. Dean Ramsay told a story of a Highlander to whom he had remarked that whisky

was a very bad thing. "Ay," said he, "whisky is a very bad thing, especially bad whisky." And so with tea. Bad, adulterated tea is a very bad thing. I find from a calculation that I have made that every inhabitant of the British Isles in 1881 consumed tea to the value of six shillings and threepence. A cup of coffee, provided it be genuine, contains more of the alkaloidal stimulant than the same sized cup of tea, and, owing to the absence of astringent matter, the action of coffee is more rapid than that of tea. When the system really stands in need of a stimulant there is probably nothing equal to a cup of strong coffee. Chicory is in no way a substitute for coffee, but merely an adventitious substance added to ground coffee to reduce the price. — *Clothing* : The object of clothing varies under different circumstances; thus in cold climates it is to retain and economise the heat which is constantly being produced within the body by vital processes, such as digestion, respiration, muscular exercise and brain work. Were this heat not conserved by our clothes it would be rapidly lost by radiation and evaporation. Necessity, therefore, as much as civilisation, compels us to wear clothes in order to keep ourselves warm. A further reason, not unknown among savage nations, is that of wearing clothes for display. Taking clothing in order, underclothing should always be of wool, and we should, in this eccentric climate of ours, wear woollen materials next the skin. This reminds me to say that underclothing soon gets loaded with perspiration and particles cast off from the skin, which, being animal products, tend readily to decompose, and so this clothing should never be worn longer than a week. There is no special virtue in coloured flannel. One often hears red or blue flannel, especially when new, credited with surprising qualities. It is certainly a doubtful advantage that such does not show dirt so soon as white. I will not take upon myself the task of advising you in the selection of materials for your outer clothing. No doubt it is better to purchase really good cloth in the first instance, since honest fabrics always look well when new, and even when worn for some time keep their shape and colour better than inferior ones. No further than this will I go, but give to you the advice of Polonius to his son Laertes, in Shakespeare's tragedy of Hamlet—

"Costly thy habit as thy purse can buy,
But not express'd in fancy; rich, not gaudy;
For the apparel oft proclaims the man."

Boots and shoes should be easy, broad in the toes and soles generally. Many shoemakers appear to have an idea that the foot is formed as follows — a great toe in the centre, flanked on each side by a smaller, and outside this again by another still less. Hence the boot with pointed toe. If anyone will examine an infant's foot, still guiltless of stiff shoes, the natural shape of the foot will be found displayed. Compare the infant's foot with your own, and the distortion which the shoemaker has brought about will be at once apparent. The savage who walks bare-footed clings to the ground with his foot, which in fact is almost as pliant as his hands. Much of this prehensile power, or capacity for grasping, is lost amongst civilised nations, who wear hard unbending coverings for the feet, but the elasticity—the springiness—which the arched form of the instep imparts, remains in great measure, if the foot be treated properly. High and narrow heels give an insecure hold of the ground, and throw the weight which ought to be distributed over the sole on to the front part of the base of the toes. This unnatural position not only stretches the fibrous bands, which bind the various and complicated bones of the instep into a beautiful arch. The fibres yield, the foot flattens, elasticity and grace of movement disappear to a large extent, and aching pains are often complained of, the cause of which may be easily understood. If you wish to walk comfortably and elegantly, straight, broad soles and low heels must be worn. The fashionable boot, with its thin sole, its narrow high heel, and its pointed toe, gives a tottering, stumbling gait, quite different from the firm and secure tread we ought to possess. Is there any woman with a mind of her own, who will say that the dainty step so much desired by some, bought as it is at the cost of healthy muscular exercise, is not overvalued? I rather hope that the honest feeling and the sound judgment which has guided that sex in many better purposes, will ultimately overcome the false sentiment which now leads certain of its members to support an unbecoming and injurious custom. The management of the skin must now engage our attention. Cleanliness is in a great measure the outcome of a state of civilisation. Amongst savages, when in their wild condition, washing is almost unknown. The human being in a state of nature uses water simply to cool his body in summer, never to cleanse it. In winter, he wears unchanged the skins or mats which form his defence from the cold. The higher the state of civilisation, the more the luxury of bathing is in-

indulged in. Yet there are thousands in England who never wash the whole body from year's end to year's end. A friend of mine told me the story of a German dining at a hotel. His next neighbour seeing the condition of his hands and the black edge of mourning surrounding his nails, said to him that it was usual to wash the hands before food. "'Vot,' call my hands dirty! You should see my feet." Will our feet bear comparison with our hands and faces to-night? And yet our feet are just as much entitled to soap and water as our hands and faces. You will hardly credit it that we have in our midst people as unclean as the German. A person told me the other day without the slightest compunction that her feet had not seen water and soap for ten years, and she was quite confident she had not had a bath for twenty! This the husband corroborated. Evidently, for once, they both thought alike—that neither required it. In our early times, no sooner have we opened our eyes and uttered our first shrill cry as helpless infants, than our nurse sets about with a will, and soaps and scrubs us till our skin glows rosy pink. For six months, perhaps longer, be our home the poorest, we have a daily bath at least. As we begin to move about, and come more directly in contact with dirt, by a strange inconsistency we are less often washed; and by the end of our second year, we may, if mother is also nurse, and a successor to the honours of the bath has appeared, be put off with a weekly Saturday night's tubbing. When a little older the boy or girl in many a poor home is well off if he or she even gets that. I know there are many difficulties in the way, when rooms are small in number and families large, but still a great deal might be done by hanging a sheet across a corner of the room, behind which a thorough wash might, with due regard to propriety, be obtained. What happens when the skin is not regularly washed? The dust which is always around us, the particles thrown off by our clothes in course of wear, and the secretions which are perpetually being thrown out by the glands of the skin, all accumulating plug up the innumerable openings and prevent their working. Hence an indispensable agent in getting rid of much worn out material from the system acts but very imperfectly, and more work is thrown on the internal organs to take its place. Health suffers, and though the body, with wonderful adaptability to circumstances, submits to much, still discomfort, to say the least, to the individual arises, and annoyance to the more cleanly members of society. In speaking of the morning bath, cold water is usually

and properly preferred for this purpose by those who can bear it. Apart from its cleansing property it is valuable as promoting excretion from the skin, and so relieving deeper excretory organs; we can, by means of cold water, apply a degree of cold to the surface of the body which, when suitably regulated, is both salutary and agreeable. We may regard the action of cold, in moderation, on the heart as a means of seasonably exercising that most important of our vital organs and of maintaining its tone. But a caution must accompany every general statement, and this is no exception. There are those whom a cold bath injures instead of invigorating. The readiest test of benefit is the glow of free surface circulation, or, at least, the absence of any decided sense of chill, after immersion. Among those who are the subjects of heart weakness, of gout or rheumatism, or of over-work or under-feeding, in which case it is part of a general debility. Again, there are in some a tendency to engorgement of some of the deep-seated organs with blood; surface cold aggravates the congestive tendency, obviously, therefore, such persons, if they bathe, ought to use tepid water. The aged should avoid cold baths, whilst, on the other hand, infants, if ordinary despatch is used in bathing, have no reason to fear them; their power of reaction is excellent. All persons in health and of average strength may use a cold bath daily in summer, at least. In winter we have mornings of extreme frost, which try the strongest constitution; only the strongest are likely to benefit by a plunge on these occasions; fortunately, with us, they are the exception rather than the rule, and, for the most part, individuals of moderate powers and free from disease may carry the cleanly practice of summer through the winter months. A word on the bath itself. Those who take it should begin in summer, not winter, and so gradually become accustomed to its lowest temperature. No one should linger over it; three or four minutes are ample. After immersion the body should be quickly and well dried and rubbed before dressing; light gymnastics, dumb-bells, or club exercise may occupy the next few minutes, the clothes being partly on if the weather be cold, and breakfast, or a cup of warm tea or coffee, should follow to prevent chilling. In speaking of exercise, I must tell you shortly that it is essential to the healthy performance of the functions of both body and mind. Without it the frame becomes contracted and enfeebled, the internal functions of the body deranged, and the brain lethargic and incapable of any great mental strain.

With exercise the machinery of life goes on with vigour and regularity, and the mind is stimulated to healthy action. The precise amount of exercise required depends in a great measure upon a person's strength and his general habit of body, but under ordinary circumstances every person should, at least, pass two hours daily in open air exercise. Nor is it wise for persons in general robust health to refrain from taking out of door exercise because the weather is inclement. With proper precaution the frame may be protected against the external influences of the elements, and under this condition the exercise imparts almost as much benefit as though the weather were fine. On such occasions the delicate may take exercise within doors, selecting a large room for the purpose with the windows open, and walk backwards and forwards for an hour or more. Females, perhaps from education and inclination, are apt to neglect this important duty. But were they to attend to it, not only would they derive considerable bodily and mental benefit, but they would bestow additional grace and elegance on their movements and promote a more perfect developement of their figures. Neither age nor sex are exempt from this salutary law of nature. We are all formed with certain limbs and muscles which obviously demand exercise by which they may derive an amount of nourishment sufficient to enable them to perform their functions effectively, and if this necessity is disregarded, it will entail sooner or later a long train of ills which are the more to be deplored because they may be so easily prevented. Some persons err on the other side and take exercise in excess, and by one imprudent act "knock themselves up," as we may familiarly say, for several days. This is a short-sighted policy, for when sufficient exercise has been taken, the symptoms of fatigue are so unmistakable that it is impossible not to know when to desist. Dryden has it:

" Better to hunt in fields for health unthought,
Than fee the doctor for a nanseous draught;
The wise, for cure on exercise depend—
God never made *His* work for man to mend."

Recreation is generally considered the proper employment for the spare time; and undoubtedly we must consider it so. Of course there must be work, or there can be no need of recreation. And I think you will all agree with me, that whatever else is meant by recreation, it is something which is intended to give rest and fresh energy for daily work, to promote health, and to give pleasure. Now change of employ-

ment is exactly that which effects these three objects of recreation. We all know when we have worked long enough, and hard enough, by the sensation of fatigue. We experience this generally throughout the body, or it may be localized in some particular part. This is due to temporary exhaustion, and we meet it either by allowing the muscles to rest or by making an extra effort. I will mention to you a curious fact with regard to the effect of work upon a muscle. By gradually and steadily increasing the amount of work done by any muscles, or group of muscles, they increase gradually in size, and thus adapt themselves to the increased demand made upon them. You know, for instance, how the arm of a blacksmith, whose daily work requires a frequent use of the hammer, increases in bulk, so that the muscles become like iron hands in firmness and strength. The limit of this firmness and increase is, however, soon reached; and if the work is too far increased, it is found that the muscle, instead of growing still further, undergoes a process of degeneration, by which its fibres waste. On the other hand, when a muscle is entirely left idle, it is liable to the same process of degeneration simply from disuse. Now what does this teach us? That to increase in muscular strength, the muscles must be steadily and regularly used, and that if they are over-worked, or not worked at all, they gradually decrease in strength and waste. There are few occupations in life which will call into play all, or nearly all, the muscles of the body to any great extent; and fewer still, perhaps, in which the daily work is equally shared by muscle and brain. Increasing competition in trade tends to narrow for each man his sphere of labour, so that to be successful he must cultivate to the utmost and bring as nearly to perfection his power for work in a very narrow field. To gain wealth, or even to earn daily bread, he must concentrate in the dull repetition of a few muscular movements and mental acts nearly all his energy for many hours a day, neglecting for the time, and sometimes neglecting altogether, the varied and almost unlimited scope for the display of power, both muscular and mental, with which the body as a whole is endowed. Therefore recreation, I take it, is the turning into fresh channels the residuum of power which is left after the day's toil—time for the exercise of those muscles which he uses very little, or not at all, at his daily work—muscles which, perhaps, enable him to take a full breath, or to walk upright, as a man should,

with his shoulders thrown well back and without stooping, and, above all, time for the exercise of those mental powers, the right employment of which affords the highest pleasure, and also the best condition of rest to the weary muscles. Speaking generally, the fatigue of life is a local fatigue, or exhaustion due to the exercise of some limited portion of the muscular system, or of the mind. Time will not permit more than allusion to the different kinds of physical and mental recreation, of those to train the muscles and give strength to the body generally — the exercise of the gymnasium, and the old fashioned English games of cricket, football, rowing, &c. With regard to mental exercise, as a relief from worry and all its attendant evils, and as a means of refreshment to the whole body, it stands unrivalled by any physical recreation that has ever been devised. Of course there may be an over cultivation of the mind, which, instead of being recreative to the health of the body, is positively injurious, just as I mentioned to you there is an over cultivation of muscular power. A most common mistake with regard to recreation in modern life is probably that of making great strength in some one exercise, or in some part of the body, instead of good general health the object of recreative pursuits. The true object and purpose of recreation is not to make a man a great pedestrian or a great athlete, or even a great thinker or a great philosopher ; but it is rather by the exercise and culture of all the powers, physical and mental, with which we are endowed, to enable us to do the work of life. We now come to the last branch of my subject — sleep. Doubtless different constitutions and individuals differently employed require different amounts of sleep. Nothing dulls the intellect and weakens the recuperative facilities more than too much sleep, except overfeeding and drinking, at your age, so few things are more certain than that a man may rise too early for making the best use of his twenty-four hours. He must live in the world and keep the world's pace still. John Wesley's advice in this matter is worth knowing. He said, "Any man can find out how much sleep he really requires to repair his nervous system by rising half-an-hour earlier every morning until he finds he no longer lies awake at all on going to rest in bed, or wakes up until it is time for him to get up." Six to eight hours is usually ample for healthy adults, with nine hours every seventh day. The Iron Duke used to say, "When it is time to turn over it is time to turn out." It is a mistake to endeavour to make up for

over mental strain by an overplus of sleep. Mental over fatigue is to be repaired, not by an excess of sleep, but by bodily exercise in the open air. The sleep obtained before midnight has been termed "beauty sleep," and the reasons why early to bed and early to rise should conduce to health, and so to beauty, are not far to seek. Early rising is not only an essential quality to health, but of innumerable other advantages I need not follow. To self-indulgence we are all more or less disposed. The great Lord Chatham thus gave his advice in reference to this subject :—"I would have inscribed on the curtain of your bed and the walls of your chamber, 'If you do not rise early, you can make progress in nothing.'"

The temperature of your bedroom should not be above 65 deg. in summer, nor fall below 45 degrees in the winter. More consecutive hours are passed in our bedrooms than in any other part of our houses, and therefore they should be thoroughly ventilated with a constant amount of fresh air passing through them. The simplest mode of effecting this is to raise the lower sash of the window two or three inches, and place in a piece of wood exactly fitted into the vacant space at the bottom, so that the sash, when drawn down, will rest upon it. A perpendicular passage for the air is thus formed by the upper part of the lower, and the lower part of the upper sash. The foul air is best got rid of by making an opening in the chimney near the ceiling of the room. I may mention to you that the character of the air in a room may be readily tested by taking a clean, stoppered 10oz. bottle, and by stuffing into it a cloth on entering the room. By rapidly withdrawing this cloth, the air of the room enters the bottle; then, by adding a table-spoonful of clear lime water, and shaking the bottle violently, the air may be tested. If pure, the lime water will remain clear; if the air be foul, the lime-water will become turbid or milky in appearance, owing to the carbonic acid forming chalk by uniting with the lime of the lime-water. The desiderata for a bed, are coolness for the spine, restfulness for the trunk muscles, and warmth without too much heat or too burdensome a weight of bed-clothes. The hair mattress and bolster are preferable to feathers. Posture in bed is not unimportant. The head should be low; the feet, perhaps a trifle raised. "Sleep not upon your back, as a dead man," is a maxim attributed to Confucius, the Chinese philosopher. I am in doubt if he is responsible for the equally good advice, "Stretch yourself whenever you

awake." By this you render the circulation of the blood freer. Dr. Mortimer Granville, a London physician, has lately written that many persons who are not "habitual dreamers," are dreaming a good deal just now. His explanation of this is, that when cold weather sets in suddenly, and is much felt at night, the head, which is uncovered, has the blood supplied to it driven from the surface to the deep parts, notably the brain—the organ of the mind—with the result of light sleep and dreams. He says the obvious remedy is to wear a nightcap, or to wrap up the head warmly at night, during cold weather. I will not venture an opinion whether Dr. Granville is right in this; but it is a curious fact how the nightcap was universally discarded by both men and women,—a custom which had prevailed for centuries—was abandoned within a few years. Why have we abandoned them? Were our ancestors more intolerant of draughts than we are? Or were there more chinks and crannies in the windows and doors than at present? I think not; for the jerry builder was never so prevalent in the old days as he is now. It must be that our forefathers and foremothers hated draughts, for they not only wore night-caps, but slept in four-post beds with curtains snugly drawn all round, whereas we, their descendants, lie bare-headed in French bedsteads. Four posters are now considered unhealthy and antiquated, and yet our grandparents, taken all round, were quite as healthy, and quite as well developed as ourselves. We may, therefore conclude that our bodies are capable of adapting themselves to all sorts of varying conditions, and that as old furniture and old fashions are constantly being revived, who knows but the next generation will wear night-caps and sleep in four-post beds. With the ancient Jews the custom prevailed of sleeping with the head and feet directed to the north and south. Unfortunately, there is some discrepancy in opinion amongst those who advocate this position during sleep. The Hindoos, it is said, believe that to sleep with the head to the north will cause one's days to be shortened, to the south will bring longevity. On the other hand, an Italian physician, who died at the advanced age of 109, declared in his will that he owed the protraction of his term of life to the fact of his frequently assuming the recumbent position, with the head to the north pole, by which means the magnetic currents pervading the globe are enabled to exert a certain influence on the iron contained in the body. The hygienist, how-

ever, seeks not to lengthen out the days of age and decrepitude. His art is not to prolong life beyond its natural term, though this may come subordinately, but to render longer its period of activity and usefulness. I have hastily sketched out *some* of the ways and means to personal health, dealing with them in a slight and incomplete manner. My aim has been less to exhaust any point than to awaken a lively interest in the subject. At first sight, it may appear that to become concerned about health is apt to foster fanciful ideas, and to lead to valetudinarianism, and that there is something trivial in caring for the body. We are bound to obey the laws of God not as they concern part of our being, but the whole; and the better we know the laws which govern us, the fewer will be the vague terrors which will assail us. In conclusion, in the words of Bacon—"let no man out of a weak conceit of sobriety, or an ill-applied moderation, think or maintain that a man can search too far or be too well studied * * * * in the book of God's works, but rather let men endeavour an endless progress."



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